

ABSTRACT

A cleaning system that utilizes an organic cleaning solvent and pressurized fluid solvent is disclosed. The system has no conventional evaporative hot air drying cycle. Instead, the system utilizes the solubility of the organic solvent in pressurized fluid solvent as well as the physical properties of pressurized fluid solvent. After an organic solvent cleaning cycle, the solvent is extracted from the textiles at high speed in a rotating drum in the same way conventional solvents are extracted from textiles in conventional evaporative hot air dry cleaning machines. Instead of proceeding to a conventional drying cycle, the extracted textiles are then immersed in pressurized fluid solvent to extract the residual organic solvent from the textiles. This is possible because the organic solvent is soluble in pressurized fluid solvent. After the textiles are immersed in pressurized fluid solvent, pressurized fluid solvent is pumped from the drum. Finally, the drum is de-pressurized to atmospheric pressure to evaporate any remaining pressurized fluid solvent, yielding clean, solvent free textiles. The organic solvent is preferably selected from terpenes, halohydrocarbons, certain glycol ethers, polyols, ethers, esters of glycol ethers, esters of fatty acids and other long chain carboxylic acids, fatty alcohols and other long-chain alcohols, short-chain alcohols, polar aprotic solvents, siloxanes, hydrofluoroethers, dibasic esters, and aliphatic hydrocarbons solvents or similar solvents or mixtures of such solvents and the pressurized fluid solvent is preferably densified carbon dioxide.